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EXAMINER	
BAER, JENNIFER M	

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2809	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

TH

Office Action Summary	Application No.	Applicant(s)	
	10/563,877	ENDO, HIRONORI	
	Examiner	Art Unit	
	Jennifer M. Baer	2809	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/9/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 20 recites the limitation "said carry unit" in line 33. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-15, 17-19, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al (US 6,527,360 B2) in view of Mizuno et al. (US 4,983,854).

In regards to claim 1, Otsuki et al. teaches a printing apparatus (22) comprising: a movable head (28) (Fig. 4) that performs recording on a medium (P) using ink (col. 14, lines 14-18); a first sensor (33) that can move together with said head (28) and that detects regular reflection light (Fig. 7) from said medium (P) (Fig. 20); and a second sensor (33b) that is provided separately from said first sensor (33) (Fig. 20), that can move together with said recording head (28)(Fig. 20).

Otsuki et al. fails to teach the sensor that detects diffuse reflection light from said medium. Mizuno et al teaches a sensor (41r) that detects diffuse reflection light from said medium (12) (col. 12, lines 22-24).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made to use the sensor to detect diffuse light because when light is reflected from a rough surface, like paper, it can be scattered in a diffuse manner and detecting it would lead to a more efficient printing system.

In regards to claim 2, Otsuki et al. teaches a printing apparatus (22), comprising: a carry unit (29a, 29b) that carries a medium (P) in a carrying direction (SS) (Fig. 1); a movable head (28) that performs recording on a medium (P) using ink (col. 14, lines 14-18); a first sensor (33) that can move together with said head (28) and that detects an edge (Pr) of said medium (P); and a second sensor (33b) that can move together with said head; wherein said first sensor (33) is provided further upstream with regard to said carrying direction than said second sensor (33b)(col. 16-17, lines 62-1).

Otsuki et al. fails to a sensor that detects a pattern from on said medium by said head. Mizuno et al. teach a second sensor (41L) that detects a pattern formed on said medium (49) by said head (44).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

In regards to claim 3, Otsuki et al. teaches wherein said first sensor (33) is provided further upstream with regard to a carrying direction in which said medium (P) is carried than said second sensor (33b) (col. 16-17, lines 62-1).

In regards to claim 4, Otsuki et al. teaches wherein said first sensor (33) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7); said second sensor (33b) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7) (col. 16, lines 47-48); and a direction in which said light-emitting section (33d) and said light-receiving section (33t) of said first sensor (33) are arranged is different from a direction in which said light-emitting section (33d) and said light-receiving section (33t) of said second sensor (33b) are arranged (Fig. 7) (Fig. 20).

In regards to claim 5, Otsuki et al. teaches wherein said light-emitting section (33d) and said light-receiving section (33t) of said first sensor (33) are arranged in a direction in which said medium (P) is carried (SS) (col. 7, lines 22-27) (Figs. 2, 20); and said light-emitting section (33d) and said light-receiving section (33t) of said second sensor (33b) are arranged in a direction (MS) in which said head (28) is moved (Figs. 20, 21) (col. 7, liens 13-17, col. 16, lines 47-48).

In regards to claim 6, Otsuki et al. teaches wherein said first sensor (33) is a sensor for detecting an edge (Pr) of said medium (P) (Figs. 2, 16).

In regards to claim 7, Otsuki et al. fails to teach wherein said second sensor is a sensor for detecting a pattern formed on said medium.

Mizuno et al. teaches wherein said second sensor (41L) is a sensor for detecting a pattern (col. 12, lines 17-20) formed on said medium (49) by said head (44).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

In regards to claim 8,Otsuki et al. teaches wherein said first sensor (33) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7); said light-emitting section (33d) of said first sensor (33) irradiates light onto said medium (P) (Fig. 7); and said light-receiving section (33t) of said first sensor (33) receives regular reflection light (Fig. 7) from said medium (P).

In regards to claim 9, Otsuki et al. fails to teach said light-receiving section of said second sensor receives diffuse reflection light from said medium.

Mizuno et al. teaches wherein said second sensor (41L) includes a light-emitting section (LED_L) and a light-receiving section (PT_L); said light-emitting section (LED_L) of said second sensor (41L) irradiates light (col. 9, lines 25-28) onto said medium (49); and

said light-receiving section (PT_L) of said second sensor (41L) receives diffuse reflection light (col. 12, lines 22-24) from said medium (49).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made to use the sensor to detect diffuse light because when light is reflected from a rough surface, like paper, it can be scattered in a diffuse manner and detecting it would lead to a more efficient printing system.

In regards to claim 10, Otsuki et al. teaches wherein said carry unit (29a, 29b) is controlled in accordance with the detection result of said first sensor (33) (col. 6, lines 35-38, col. 7, lines 23-27).

In regards to claim 11, Otsuki et al. teaches wherein said head (28) is controlled in accordance with the detection result of said first sensor (33) (col. 14, lines 49-52).

In regards to claim 12, Otsuki et al. teaches wherein said first sensor (33) detects a lateral edge (Pb) of said medium (P); and a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lateral edge (Pb)(col. 7, lines 23-31).

In regards to claim 13, Otsuki et al. teaches wherein said first sensor (33) detects an upper edge (Pf) of said medium (P); and said carry unit (29a, 29b) carries said

medium (P) to a print start position in accordance with the result of detecting said upper edge (col.13, lines 30-51, col.14, lines 49-52).

In regard to claim 14, Otsuki et al. teaches wherein said first sensor (33) detects a lower edge (Pr) of said medium (P); and a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lower edge (Pr) (Fig. 8).

In regards to claim 15, Otsuki et al. teaches wherein an ejection test (Fig. 21) of said head (28) is performed in accordance with the result of detecting with said second sensor (33b).

Otsuki et al. fails to teach detecting a pattern. Mizuno et al. teaches wherein said second sensor (41L) is a sensor for detecting a pattern (col. 12, lines 17-20).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head and eject ink since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

In regards to claim 16, Otsuki et al. and Mizuno et al. fail to teach a process of cleaning said head is performed.

Arai et al. teaches a process of cleaning said head (12) is performed (paragraph [0076]).

Since Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made for the sensor to detect whether the head needed cleaning because a head is not efficient if it is obstructed and cleaning would clear the head of any blockage.

Since Otsuki et al., Mizuno et al., and Arai et al. teach inkjet printers, it would have been obvious to one skilled in the art at the time the invention was made to use the cleaning process of Arai et al. with the sensor detection of Otsuki et al. and Mizuno et al. because it would provide for a more efficient and cost effective printer to have the head clear of any obstruction that is detected and would lead to a more desirable image.

In regards to claim 17, Otsuki et al. teaches wherein said head (28) can eject said ink (Figs. 21, 24) while moving in a forward pass (MS) and in a return pass (MS)(Fig. 20); and locations at which ink is to be ejected from said head (28) are determined in accordance with the detection result of said second sensor (33b) (Fig. 24, col. 16, lines 52-61).

In regards to claim 18, Otsuki et al. fails to teach wherein the type of said medium is detected from the detection result of said first sensor and the detection result of said second sensor.

Mizuno et al. teaches wherein the type of said medium (12) is detected from the detection result of said first sensor and the detection result of said second sensor (4b) (col. 5, lines 3-16).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection.

In regards to claim 19, Otsuki et al. fails to teach wherein said head performs the recording on said medium in accordance with the type of said medium.

Mizuno et al. teaches wherein said head (44) performs the recording on said medium in accordance with the type of said medium (12)(col.8, lines 37-47).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection.

In regards to claim 22, Otsuki et al. teaches a printing system (Fig. 3) comprising: a computer (90); and a printing apparatus (22), said printing apparatus (22) including: A movable head (28) that performs recording on a medium (P) using ink (col. 14, lines 14018); a first sensor (33) that can move together with said head (28) and that detects regular reflection light (Fig. 7) from said medium (P)(Fig. 20); and a second sensor (33b) that is provided separately from said first sensor (33)(Fig. 20), that can move together with said recording head (28) (Fig. 20)

Otsuki et al. fails to teach the sensor that detects diffuse reflection light from said medium. Mizuno et al teaches a sensor (41r) that detects diffuse reflection light from said medium (12) (col. 12, lines 22-24).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made to use the sensor to detect diffuse light because when light is reflected from a rough surface, like paper, it can be scattered in a diffuse manner and detecting it would lead to a more efficient printing system.

In regards to claim 23, a printing system (Fig. 3) comprising: a computer (90); and a print apparatus (22), said printing apparatus (22) including: a carry unit (29a, 29b) that carries a medium (P) in a carrying direction (SS); a movable head (28) that performs recording on a medium (P) using ink (col. 14, lines 14-18); a first sensor (33) that can move together with said head (28) and that detects an edge (Pb) of said

medium (P)(col. 7, lines 23-31); and a second sensor (33b) that can move together with said head (28); wherein said first sensor (33) is provided further upstream with regard to said carrying direction than said second sensor (33b)(col. 16-17, lines 62-1).

Otsuki et al. fails to a sensor that detects a pattern from on said medium by said head. Mizuno et al. teach a second sensor (41L) that detects a pattern formed on said medium (49) by said head (44).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

3. Claims 16, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al (US 6,527,360 B2) and Mizuno et al. (US 4,983,854) in view of Arai et al. (US 2002/0175970 A1).

In regards to claim 16, Otsuki et al. and Mizuno et al. fail to teach a process of cleaning said head is performed.

Arai et al. teaches a process of cleaning said head (12) is performed (paragraph [0076]).

Since Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made for the sensor

to detect whether the head needed cleaning because a head is not efficient if it is obstructed and cleaning would clear the head of any blockage.

Since Otsuki et al., Mizuno et al., and Arai et al. teach inkjet printers, it would have been obvious to one skilled in the art at the time the invention was made to use the cleaning process of Arai et al. with the sensor detection of Otsuki et al. and Mizuno et al. because it would provide for a more efficient and cost effective printer to have the head clear of any obstruction that is detected and would lead to a more desirable image.

In regards to claim 20, Otsuki et al. teaches a printing apparatus (22) comprising:
a movable head (28) (Fig. 4) that performs recording on a medium (P) using ink (col. 14, lines 14-18);
a first sensor (33) that can move together with said head (28) and that detects regular reflection light (Fig. 7) from said medium (P) (Fig. 20);
a second sensor (33b) that is provided separately from said first sensor (33) (Fig. 20), that can move together with said recording head (28)(Fig. 20):
wherein said first sensor (33) is provided further upstream with regard to a carrying direction in which said medium (P) is carried than said second sensor (33b) (col. 16-17, lines 62-1);
wherein said first sensor (33) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7);

said second sensor (33b) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7) (col. 16, lines 47-48);

a direction in which said light-emitting section (33d) and said light-receiving section (33t) of said first sensor (33) are arranged is different from a direction in which said light-emitting section (33d) and said light-receiving section (33t) of said second sensor (33b) are arranged (Fig. 7) (Fig. 20);

said light-emitting section (33d) and said light-receiving section (33t) of said first sensor (33) are arranged in a direction in which said medium (P) is carried (SS) (col. 7, lines 22-27) (Figs. 2, 20);

said light-emitting section (33d) and said light-receiving section (33t) of said second sensor (33b) are arranged in a direction (MS) in which said head (28) is moved (Figs. 20, 21) (col. 7, liens 13-17, col. 16, lines 47-48);

said first sensor (33) is a sensor for detecting an edge (Pr) of said medium (P) (Figs. 2, 16);

said carry unit (29a, 29b) is controlled in accordance with the detection result of said first sensor (33) (col. 6, lines 35-38, col. 7, lines 23-27);

said head (28) is controlled in accordance with the detection result of said first sensor (33) (col. 14, lines 49-52);

said first sensor (33) detects a lateral edge (Pb) of said medium (P);a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lateral edge (Pb)(col. 7, lines 23-31);

said first sensor (33) detects an upper edge (Pf) of said medium (P); said carry unit (29a, 29b) carries said medium (P) to a print start position in accordance with the result of detecting said upper edge (col.13, lines 30-51, col.14, lines 49-52);

said first sensor (33) detects a lower edge (Pr) of said medium (P); and a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lower edge (Pr) (Fig. 8);

an ejection test (Fig. 21) of said head (28) is performed in accordance with the result of detecting with said second sensor (33b);

said head (28) can eject said ink (Figs. 21, 24) while moving in a forward pass (MS) and in a return pass (MS)(Fig. 20);

locations at which ink is to be ejected from said head (28) are determined in accordance with the detection result of said second sensor (33b) (Fig. 24, col. 16, lines 52-61).

Otsuki et al. fails to teach the sensor that detects diffuse reflection light from said medium, said second sensor is a sensor for detecting a pattern formed on said medium, a process of cleaning said head is performed, the type of said medium is detected from the detection result of said first sensor and the detection result of said second sensor, and said head performs the recording on said medium in accordance with the type of said medium.

Mizuno et al teaches a sensor (41r) that detects diffuse reflection light from said medium (12) (col. 12, lines 22-24). Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made to use the sensor to detect diffuse light because when light is

reflected from a rough surface, like paper, it can be scattered in a diffuse manner and detecting it would lead to a more efficient printing system..

Mizuno et al. also teaches wherein said second sensor (41L) is a sensor for detecting a pattern (col. 12, lines 17-20) formed on said medium (49) by said head (44). Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

Both Otsuki et al and Mizuno et al. fail to teach a process for cleaning said head. Arai et al. teaches a process of cleaning said head (12) is performed (paragraph [0076]). Since Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made for the sensor to detect whether the head needed cleaning because a head is not efficient if it is obstructed and cleaning would clear the head of any blockage.

Since Otsuki et al., Mizuno et al., and Arai et al. teach inkjet printers, it would have been obvious to one skilled in the art at the time the invention was made to use the cleaning process of Arai et al. with the sensor detection of Otsuki et al. and Mizuno et al. because it would provide for a more efficient and cost effective printer to have the head clear of any obstruction that is detected and would lead to a more desirable image.

Mizuno et al. teaches wherein the type of said medium (12) is detected from the detection result of said first sensor and the detection result of said second sensor (4b) (col. 5, lines 3-16). Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection..

Mizuno et al. teaches wherein said head (44) performs the recording on said medium in accordance with the type of said medium (12)(col.8, lines 37-47).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection.

In regards to claim 21, Otsuki et al. teaches a printing apparatus (22) comprising: a carry unit (29a, 29b) that carries a medium (P) in a carrying direction (SS) (Fig. 1);

a movable head (28) that performs recording on a medium (P) using ink (col. 14, lines 14-18);

a first sensor (33) that can move together with said head (28) and that detects an edge (Pr) of said medium (P);

a second sensor (33b) that can move together with said head (28);

wherein said first sensor (33) is provided further upstream with regard to said carrying direction than said second sensor (33b)(col. 16-17, lines 62-1);

said carry unit (29a, 29b) is controlled in accordance with the detection result of said first sensor (33) (col. 6, lines 35-38, col. 7, lines 23-27);

said head (28) is controlled in accordance with the detection result of said first sensor (33) (col. 14, lines 49-52);

said first sensor (33) detects a lateral edge (Pb) of said medium (P);a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lateral edge (Pb)(col. 7, lines 23-31);

said first sensor (33) detects an upper edge (Pf) of said medium (P); said carry unit (29a, 29b) carries said medium (P) to a print start position in accordance with the result of detecting said upper edge (col.13, lines 30-51, col.14, lines 49-52);

said first sensor (33) detects a lower edge (Pr) of said medium (P); and a region onto which ink is to be ejected from said head (28) is determined in accordance with the result of detecting said lower edge (Pr) (Fig. 8);

an ejection test (Fig. 21) of said head (28) is performed in accordance with the result of detecting with said second sensor (33b);

said head (28) can eject said ink (Figs. 21, 24) while moving in a forward pass (MS) and in a return pass (MS)(Fig. 20);

locations at which ink is to be ejected from said head (28) are determined in accordance with the detection result of said second sensor (33b) (Fig. 24, col. 16, lines 52-61);

said first sensor (33) includes a light-emitting section (33d) and a light-receiving section (33t) (Fig. 7);

said light-emitting section (33d) of said first sensor (33) irradiates light onto said medium (P) (Fig. 7);

said light-receiving section (33t) of said first sensor (33) receives regular reflection light (Fig. 7) from said medium (P).

Otsuki et al. fails to teach said second sensor is a sensor for detecting a pattern formed on said medium, a process of cleaning said head is performed, the type of said medium is detected from the detection result of said first sensor and the detection result of said second sensor, and said head performs the recording on said medium in accordance with the type of said medium, and said light-receiving section of said second sensor receives diffuse reflection light from said medium.

Mizuno et al. also teaches wherein said second sensor (41L) is a sensor for detecting a pattern (col. 12, lines 17-20) formed on said medium (49) by said head (44). Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect a pattern formed by the head since it was suggested in Mizuno et al. (col. 8, lines

48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts.

Both Otsuki et al. and Mizuno et al. fails to teach a process of cleaning said head. Arai et al. teaches a process of cleaning said head (12) is performed (paragraph [0076]). Since Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made for the sensor to detect whether the head needed cleaning because a head is not efficient if it is obstructed and cleaning would clear the head of any blockage.

Since Otsuki et al., Mizuno et al., and Arai et al. teach inkjet printers, it would have been obvious to one skilled in the art at the time the invention was made to use the cleaning process of Arai et al. with the sensor detection of Otsuki et al. and Mizuno et al. because it would provide for a more efficient and cost effective printer to have the head clear of any obstruction that is detected and would lead to a more desirable image.

Mizuno et al. teaches wherein the type of said medium (12) is detected from the detection result of said first sensor and the detection result of said second sensor (4b) (col. 5, lines 3-16). Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is

used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection..

Mizuno et al. teaches wherein said head (44) performs the recording on said medium in accordance with the type of said medium (12)(col.8, lines 37-47).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in that art at the time the invention was made for the sensor to detect the type of medium since it was suggested in Mizuno et al. (col. 8, lines 48-50) that such a detector provides for a high durability in the printer because the apparatus does not use mechanical contacts and determining which medium is used will lead to a more efficient printer because an appropriate type and amount of ink can be determined from the detection.

Mizuno et al. teaches wherein said second sensor (41L) includes a light-emitting section (LED_L) and a light-receiving section (PT_L); said light-emitting section (LED_L) of said second sensor (41L) irradiates light (col. 9, lines 25-28) onto said medium (49); and said light-receiving section (PT_L) of said second sensor (41L) receives diffuse reflection light (col. 12, lines 22-24) from said medium (49).

Since both Otsuki et al. and Mizuno et al. teach sensors for printers, it would have been obvious to one skilled in the art at the time the invention was made to use the sensor to detect diffuse light because when light is reflected from a rough surface, like paper, it can be scattered in a diffuse manner and detecting it would lead to a more efficient printing system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Baer whose telephone number is 571-270-1621. The examiner can normally be reached on mon-fri, 7:30-5:00, Alt Fri est. time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on 571-270-1809. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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